

Commonwealth of Kentucky
Division for Air Quality
PERMIT STATEMENT OF BASIS

TITLE V (DRAFT) No. V-03-004

DARAMIC, INC. COMPANY

OWENSBORO, KY.

APRIL 14, 2004

MASSOUD KAYVANJAH, REVIEWER

PLANT I.D. # 021-059-00006

APPLICATION LOG #51264

SOURCE DESCRIPTION: Daramic produces Polyethylene Web, which is used for electrical insulator between charged plates in acid batteries. There are four main processes for this production:

Bulk materials [silica, polyethylene, heavy oil plasticizer, and oil solvent (a 100% VOCs solution containing n-Hexane with CAS # 10-54-3, a Hazardous Air Pollutant)] are received by rail cars and stored in silos/tanks to be conveyed and circulated for mixing. The plasticized mixture is extruded as continuous plastic sheet, and is drawn through sealed baths of solvent to extract the oil from the sheet to produce the polyethylene web. The main solvent used in the extractors' bath is n-Hexane to remove the oil from the plastic sheet. The processed plastic sheet (web) is dried in ovens and most of the solvent is recovered for recycling by means of condensers and three emissions control units of carbon beds.

Three boilers with capacities of 63 mmBtu/hr, 26.8 mmBtu/hr and 22.3 mmBtu/hr provide both space and process heat. All boilers are natural gas fired with capability of burning #2 fuel oil as the back up source.

Permit background:

Permit #	Issuance Date	Summary of Action
		Extractor Line I installed 1969, and Line II installed April 1969 Carbon Bed #1 for Extractors I & II installed April 1972
O-73-144	6/7/ 1973	Permit issued to W.R. Grace & Co. for production of paper base resin battery plate insulators with average 3000 lb/day hexane (547.5 TPY) emission.
O-79-286	6/27/ 1979	Company's letter of Feb. 2, 1983 informs that the plant is separated into four sections: 1- Paper battery insulator 2- Plastic battery insulator 3- Paper Mill 4- Organic Chemicals manufacturing VOC emissions average 270.4 Tons/Year
O-84-072	6/22/ 1984	Permit issued for Paper Mill consisting of three Curing Ovens, one Phenolic resin Impregnator Oven, Extractor Oven, and four Boilers (capacities of 22.3, 26.8, 63, and 1.1 mmBTU/hr burning Natural gas and #2 fuel oil as backup).
C-86-020	2/2/ 1986 5/18 1987	Gas fired incinerator, and plastic extruder was installed. Production line speed was increased from 37500 pieces/hr to

		66666 pieces/hr.
Permit #	Issuance Date	Summary of Action
C-88-021	2/10/ 1988	Replacement of Chopper to increase production of the existing battery separator Line, with VOC emission increase less than 40 T/Y. Formaldehyde emission Max. 1.12 lb/hr.
C-89-084	5/30/ 1989	Conveying of Polyethylene 2096 T/Y, Silica 4542 T/Y, heavy Oil 10483 T/y, anti-Oxidant 87 T/Y, Wetting agent 87 T/y.
C-90-109 of 7/10/1990 is revised by (Revision-1) of 9/14/1990	9/14/ 1990	Extractor Line III with Evaporator, Drying Tunnel, and Drying Oven are added to the existing Extractor Line I mainly under the following conditions: 1- Make process improvement to Extraction Line I to reduce fugitive VOC emissions such that the net emissions from the construction shall not exceed 39.9 T/Y. 2- The minimum process improvement efficiency (reduction in VOC emission) for Line I shall be at least 22%. 3- Plantwide hexane emissions shall not exceed 104.5 lb/hr.
C-90-109 (Revision-2)	6/17/ 1994	Web extraction of Line 3 is increased from 2000 lb/hr to 2538 lb/hr with the same above conditions 1, & 2, and 104.5 lb/hr plantwide of hexane emissions.
C-90-109 (Revision-3)	5/4/ 1995	Production rates of Extraction Lines 1 & 3 are deleted from the permit, instead, based on submitted dispersion modeling for Hexane, a plantwide emission of 121 lb/hr is set, and the usage of solvent (content n-Hexane and other VOCs) for Lines I & III is set to be 118000 Gallons/Y.
C-91-052	5/7/ 1991	Construction of Conveying materials, and two extruders.
S-95-019	2/27/ 1995	Amended application of Dec. 5, 1994 reflect a change in ownership and name to Daramic, Incorporated. Construction of Extractor Line 4 with n-Hexave emissions limit of 24.46 lb/hr for Drying Oven, LEL Oven, Coater Dryer, Web rewinder, and Tanks with Carbon Bed for emission control device, under the plantwide emission of 121 lb/hr for n-Hexane. Memorandum dated Dec. 5, 1994 indicates Construction of Extractor Line 4 has netted out of the PSD review for VOC.
S-95-080	5/2/ 1995	Addition of a WP6 Mixer, and WP6 Extruder.

COMMENTS:

Plant's main air pollutants are VOC and n-Hexane (HAP) from solvent, and the amount of emissions are determined from the monthly usage records of solvent, and from the purchase documents.

Dispersion modeling has been performed with The VOC Solution containing 87% Hexane which showed its emissions complies with 401 KAR 63:020 requirement.

Daramic was found to be in violation of the synthetic minor limit set on Extractor Lines I and III. The synthetic minor limit was set at the time of construction of Line III. Daramic is going to submit a PSD permit application for Line III. Daramic is going to submit with the PSD application, a request with appropriate applicable requirements for Line I to avoid PSD requirements.

Daramic is required to monitor the parameters and follow the procedures listed in the VOC/Hexane monitoring plan. This plan was submitted by Daramic during comment period for draft Title V permit. Daramic is also required to keep a copy available at plant site for inspection by the Division.

Notes:

The requirements for storage tanks emission points 23 and 24 is based on Vapor Pressure of Solvent being 3.2 psi at Standard Temperature of 25 degrees Celsius (77 degrees Fahrenheit).

During summer season the fugitive hexane emissions is considerably higher than the average of 217 gallons per day plantwide emissions.

APPLICABLE REGULATIONS:

401 KAR 63:021, Existing sources emitting toxic air pollutants applies to n-Hexane emissions.

401 KAR 63:020, Potentially hazardous matter or toxic substances applies to all hazardous or toxic air pollutants.

401 KAR 63:010, applies to fugitive emissions.

401 KAR 61:015, Existing indirect heat exchangers, applies to the boilers EP#1, EP#2, and EP#3 with a total rated capacity of $63.0 + 26.8 + 22.3 = 112.1$ mmBTU/hr heat capacity.

401 KAR 61:020, applies to particulate matter emissions from processes commenced construction before July 2, 1975.

401 KAR 59:010, New Process Operation applies to the particulate matter processes that commenced on or after July 2, 1975.

EMISSION AND OPERATING CAPS DESCRIPTION:

The source wide emission cap for n-Hexane is 121 lbs/hr.

The solvent usage limit for Extraction lines I and III is 118,000 gallons/year.

PERIODIC MONITORING: See the permit condition.

OPERATIONAL FLEXIBILITY: NONE

CREDIBLE EVIDENCE:

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has not incorporated these provisions in its air quality regulations.

PUBLIC AND U.S. EPA REVIEW:

On December 10, 2003, the public notice on availability of the draft permit and supporting material for comments by persons affected by the plant was published in the *Messenger-Inquirer* in Owensboro, Kentucky. The public comment period expired 30 days from the date of publication. During this time no comments were received from the general public or the affected states (Indiana).

On January 12, 2004 Daramic has sent comments about the Draft Permit that are addressed in the

attachment A of this Proposed Permit. Daramic has included with comments few additional existing emission units and insignificant activities that were not included in Title V application.

On February 6, 2004 Division has requested Daramic for submission of the required application forms for the emission units and the activities that have not been included in the presented permit application.

Per 401 KAR 52:020 Section 7 (3) (c), a permit revision is required to address a Supplement Application for the left out units. Permit revision will be performed when all the required information in the application forms are completed and submitted.

ATTACHMENT A

COMMENTS FROM DARAMIC AND DIVISIONS RESPONSE TO COMMENTS

PERMIT STATEMENT OF BASIS

Comment 1:

The term SOLAF refers to an internal designation by Daramic, Inc. for any of the following:

Hexane, n-hexane, mixtures of hexane and other organic compounds used to extract oil from the web. The facility requests that the Division for Air Quality replace the term SOLAF in the Title V with the term SOLVENT. For the purpose of discussion, we have replaced the term SOLAF with the term SOLVENT in the remainder of this comment letter.

Division Response 1:

The term “Solaf” is replaced with “Solvent”, in the Statement of Basis, and in the permit.

Comment 2:

The Permit Statement of Basis indicates that the facility utilizes SOLVENT, with n-hexane content of 87% as one of its primary raw materials. By letter dated July 14, 2003. Daramic advised the Kentucky Division for Air Quality that the facility now exclusively uses SOLVENT with a 65% n-hexane content. The switch in raw materials has resulted in a substantial reduction in emissions of hexane from the facility. Therefore, any conditions in the permit with respect to hexane emissions or solvent usage should not specify SOLVENT as being comprised of 87% hexane. In fact, all emission limitations should be written in terms of pounds of VOC or pounds of hexane and should not be specified in terms of solvent usage rates in order to provide the company with flexibility to utilize solvents with a lower VOC or hexane content if such products become available and effective.

Division Response 2:

Per Daramic request, Division has changed emissions limits to tons of VOC in the permit. The Statement of Basis is modified to add that modeling has been performed with VOC solution containing 87% Hexane, which showed in compliance with 401 KAR 63:020 requirement.

Comment 3:

On page 2 of the Permit Statement of Basis, a statement is made that Daramic will be submitting a PSD Permit application for Extractor Line III, and is going to keep the limits that were set on Extractor Line I. While Daramic has agreed in principle with the Division to submit a PSD permit application for Line III as part of a resolution of an enforcement matter, there should be no usage limitations set on Extractor Line I after the PSD permit is issued because the existing usage limitation on Extractor Lines I and III (i.e., a combined 118,000 gallons per year) was imposed solely to limit the emission increase that would be associated with the construction of

Line III so as to avoid PSD review, Line I was never modified and is a pre-existing unit. Moreover, there is no identified "share" of the 118,000 gallon per year limit that was ever established as a separate limitation for Line I. Because Line III will be subject to PSD review upon submittal of the PSD permit application in mid January 2004, the prior minor source emission cap (39.9 TPY and corresponding solvent usage limit for VOCs) would no longer be applicable to either Line I or Line III after the PSD permit is issued for Extractor Line III. PSD review for Line III would not involve any review of Line I since it was not modified. Nevertheless, Daramic would agree to maintain all existing controls on Extractor Line I. Moreover, it is premature to reference future permit conditions in the permit documents for the existing facility.

Division Response 3:

Issuance of permit C-90-109 dated July 10, 1990 and its revision dated September 14, 1990 for construction of Extraction Line III simultaneously established requirement for an emission reduction of 22% on Extraction Line I. This reduction of VOC emission on Line I has been implemented according to the letter of W.R. Grace & Co. dated 22 February 1991 claiming a 47.4% emission reduction on Line I (from 62.51 lbs/hr in May 1990 to 32.88 lbs/hr in September 1990). Also the above permit conditioned an annual amount of 118,000 Gallons of solvent usage for Lines I and III. This is a synthetic minor limit set to preclude applicability of PSD. This limit has been exceeded. The exceedance would subject both Lines I and III to PSD. Division wants to clarify that even though there is no "physical change" on Line I, the exceedance of a federally enforceable limit is viewed as a "change in method of operation", which is a "modification" under PSD. The details about future extraction lines' limits will be deleted from permit.

The language in Statement of Basis is changed to delineate that, all the issues regarding this "modification" will be handled through PSD application and applicable permitting procedure.

SPECIFIC COMMENTS ON DRAFT TITLE V PERMIT

1. Section B. Group 02 (01) Material Handling and Storage

Section B. Group 03 (02) Seven Mixers

Section B. Group 04 (03) Six Extruders

The process units in this section do not accurately reflect the equipment, control equipment, and processes currently installed and operational at this facility. We have included in Attachment 5 a corrected process and equipment list. For clarification, we have prepared and include in Attachment 8 a new process flow diagram describing the processes, material flow rates, and control equipment and emission points for the material mixing, and extractor processes. We have included in Attachment 7 corrected process rates for the mixing and extruding process. These rates reflect the current equipment capacity in the material handling and storage area. We have included in this attachment a corrected PM emission limitation table (using 401 KAR 59:010 Appendix A) for the material handling process units. Please update the Section B, Group 02, Group 03, and Group 04 to reflect the current equipment, process rates, control equipment and process points. Please note that the emission point for the Group 02 and Group 03 processes are inside the mix tower.

There are no point source stack emissions that exhaust directly to the outside in Group 02 or Group 03 processes. The emissions are through control equipment or controlled vents inside the building.

Section B -Group 06 (05) Extractor Line III

The Process Unit 4 "Evaporator" should be listed as Evaporator 2.
This extractor process line should include a line 2 coater dryer.

Section B -Group 07 (04) Extractor Line II

The Process Unit 4 "Evaporator" should be listed as Evaporator I.
This extractor process line should include a line 3 coater dryer.

Section B -Group 08 (06) Extractor Line IV

This process unit should include Evaporator 3.

Section B -Group 05 (04) Extractor Line I and Group 06 (05) Extractor Line III

The operating limitation of 118,000 gallons per year of SOLVENT on Extractor Lines I and III should not reference 87% hexane. The operating limitation should be revised to read:

The consumption allocation of purchased SOLVENT with 100% VOC content in Extractor Lines I and III together shall not exceed 118,000 gallons/year .

The compliance demonstration on page 11 of 27 that relates to daily VOC emission calculations should be deleted First, there is no basis for a daily VOC calculation to be performed since the limitation on VOC emissions from Extractor Lines I and III are based on annual emissions. Second, the prior permits established the 118000 gallons per year operating limitation as the basis for demonstrating compliance with the annual VOC emission limitation. Third, no basis is provided in the permit or in prior permits for calculating the yearly emission reduction on Extractor Line I. Therefore, Daramic requests that compliance continue to be demonstrated solely through the SOLVENT release allocation of purchased SOLVENT operating limit in conjunction with the Standard Operating Procedures developed for Line I. (See page 10 of 27).

Attached hereto as Attachment 1 is proposed language which Daramic requests be included under the Specific Monitoring Requirements for Extractor Lines I and III for calculating the monthly usage rate of SOLVENT on both extractor lines and the corresponding VOC emission rate. We believe it is more desirable to include the language in the permit at this time rather than to merely require submittal of an approved emission calculation methodology "for the Division's approval."

Under Specific Reporting Requirements on page 11 of 27, the reference to "daily" VOC emission calculations should be revised to a "12-month rolling emission calculation." this is consistent with the approach that is used for reporting monthly and 12-month rolling VOC emissions to the Owensboro Regional Office at the current time.

DIVISION RESPONSE TO SPECIFIC COMMENTS ON DRAFT TITLE V PERMIT

About Section B – Groups 02 (01) Material Handling and Storage,
 Groups 03(02) Seven Mixers,
 Groups 04(03) Six Extruders,
 Groups 06(05) Extractor Line III,
 Group 07(04) Extractor Line II, and
 Group 08(06) Extractor Line IV

On February 6, 2004 Division has requested Daramic for submission of the required application forms for the emission units and activities that have not been included in the presented permit application. Per 401 KAR 52:020 Section 7 (3)(c), a permit revision is required to address a Supplement Application for the left out units. A permit revision will be performed when all the required information in the application forms are completed.

About Section B – Group 05 (04) Extraction Line I, and Group 06(05) Extraction Line 3.

Solvent in the permit is redefined as a 100% VOC solution.

The compliance demonstration that relates to daily VOC emission calculations is changed to monthly determination.

The 39.9 TPY is a synthetic minor limitation. That limit was always there in the prior permits. The Title V permit is providing the source a method of compliance with that limit.

Specific Monitoring Requirements of the extraction lines is revised for each extraction line to demonstrate compliance through the allocation of the solvent consumption based on the VOC emissions calculations submitted in Attachment 1, 3, and 4 of the Daramic's Comments. The permit also requires Daramic to follow the procedures listed in the VOC/Hexane monitoring plan.

SPECIFIC COMMENTS ON DRAFT TITLE V PERMIT

2. Section B --EP #09 (07) 34 Above-Ground Storage Tanks

The list of tanks in this section is incomplete. We have prepared and include in Attachment 6 an updated list of all equipment, processes, control equipment, and insignificant activities. Please note that the facility has placed all tanks that store SOLVENT under the control of one of the carbon bed VOC control units.

The permit lists four ARMA tanks. The Title V permit should include two 595 gallon ARMA tanks for Line 4 and a bulk 6000 gallon ARMA storage tank. The ARMA coater dryer does not appear to be listed on the permit.

We request that the Stencil/ing/coating operations associated with the ARMA coating operations be included in the permit. The facility submitted ARMA surfactant coaters in communication to the Division for Lines 2, 3, and 4. Letters from the facility to the Division for Air Quality requesting these coaters are included in Attachment 2.

DIVISION RESPONSE TO SPECIFIC COMMENTS ON DRAFT TITLE V PERMIT

About Comment 2. Section B – Group 05 (04) Extraction Line I, and Group 06(05) Extraction Line 3.

See Division response to the specific comment 1 above (on page 8).

SPECIFIC COMMENTS ON DRAFT TITLE V PERMIT

3. Section D -Source Emission Limitations and Testing Requirements

Paragraph 1.a. on page 17 of 27 should be deleted since VOC emissions are measured based upon the usage and consumption of SOLVENT and other raw materials. Therefore, it is not necessary to utilize Reference Test methods for calculating VOC emissions since it is assumed that all SOLVENT that is consumed results in VOP emissions.

Attached hereto as Attachment 4 is a methodology for calculating monthly emissions of hexane from all emission units. The methodology is based on the emission assumptions and calculations presented in Attachment 5. Daramic requests that this methodology be incorporated into the permit in lieu of the requirement for the permittee to submit a hexane monitoring plan within 60 days of issuance of the proposed permit.

The draft Title V does not include all process units in operation at this facility; consequently we have prepared and include as Attachment 7, a corrected list of plant process units and equipment. The updated equipment and process list includes a recommendation for process unit numbering using groups and process units following the Title V format. The facility has also included in the Attachment 6 table a listing of new control equipment. The material mixing area has a dust collector that controls emissions from several units in this process area. This dust collector in the mix material was installed subsequent to the Title V permit application submittal.

The facility has included in **Attachment 6 a DEP 7007DD Insignificant Activity** form and a list of insignificant activities. The facility has included this list to insure that all current process units and equipment are listed appropriately in the Title V permit.

The facility has prepared a corrected process rate table to reflect potential process rates if different than the rates listed in the Draft TV Permit. These rates are included in Attachment 8.

Based on the process rates that reflect current equipment capacity for throughput of material, and based on equipment controls, the facility has prepared and includes in Attachment 8 a corrected particulate emission limitation rate. The current PM emission rates listed in the Draft TV do not reflect the material throughput rates that are either actual or reflect current equipment capacity.

The facility plans to prepare and submit DEP 7007B, DEP 7007J, DEP 7007K, and DEP 7007N forms for the updated process equipment and process rates listed in the Attachments 2 through 8 with the PSD permit application.

DIVISION RESPONSE TO SPECIFIC COMMENTS ON DRAFT TITLE V PERMIT

About 3. Section D -Source Emission Limitations and Testing Requirements.

Section D, 1.a is deleted.

Section D, 1.b the part of requirement for submission of a monitoring plan for hexane is deleted, since it is already submitted with the comments.

The Attachment 4 is accepted and requirement to submit monitoring plan is deleted from the permit.

About the list of Insignificant Activity to form DEP 7007DD:

See Division's response to specific comments 1 (on page 8).

SPECIFIC COMMENTS ON DRAFT TITLE V PERMIT

4. Section I --Compliance Schedule

The provisions of this section should be deleted. It is inappropriate to include potential future emission limitations on Line I in a compliance schedule because Line I is not subject to PSD review and no PSD permit has been issued. After a PSD permit is issued for Line III, the SOLVENT usage limitation (combined) that previously applied to Line I and m should no longer be in effect. (See comments above relating to Lines I and m for the Permit Statement of Basis.) In addition, the terms of the Agreed Order have not been finalized. Daramic, Inc. requests an opportunity to meet with you to review these issues. In the meantime, if you have any questions regarding these comments, please contact me at the above phone number or email address.

DIVISION RESPONSE TO SPECIFIC COMMENTS ON DRAFT TITLE V PERMIT

About 4. Section I – Compliance Schedule

Section I-2 is deleted.

EP#02 Description:

Bulk materials of silica and polyethylene are to be downloaded into CYCLONE (PEP#00) and conveyed to three silos for storage (PEP#01-03). These materials are to be conveyed into four bins with bag houses (PEP#04-07). Carbon Black from bin with bag house (PEP#09) and Recycle Cyclone with bag house (PEP#08) is conveyed to the mixing process. Total Suspended Particulates (TSP) from material handling are to be controlled with bag houses at the plant emission points of 00-09 installed March 1989.

EP#03 Description:

Polyethylene and silica with Carbon black from Plant EP#01-09 are to be conveyed into the Mixers to be processed into resin by addition of plasticizer (heavy oil), antioxidant, and wetting agent from Plant EP#10-12.

EP#04 (02) SIX MIXERS**Description:**

Polyethylene, silica, carbon black, antioxidant, wetting agent and heavy oil (plasticizer) are mixed until resin, as feedstock for extrusion.

Plant EP#13, Mixer #1 Ross, Capacity 1200 lb/hr, 99.9 Control Efficiency Filter, Installed 1969

Plant EP#14, Mixer #2 Ross, Capacity 1200 lb/hr, 99.9 Control Efficiency Filter, Installed 1972

Plant EP#15, Mixer #3 Ross, Capacity 1200 lb/hr, 99.9 Control Efficiency Filter, Installed 1989

Plant EP#16, Mixer #4 Littleford, Capacity 3000 lb/hr, 99.9 Control Efficiency, Installed 1991

Plant EP#17, Mixer #5 Littleford, Capacity 3800 lb/hr, 99.9 Control Efficiency, Installed 1991

Plant EP#18, Mixer #6 Littleford, Capacity 3000 lb/hr, 99.9 Control Efficiency, Installed 1995

EP#05 Extruders #1 through #6**Description:**

Polyethylene resin from Mixers are fed into the extruders to be heated and forced through a die to produce the wide sheet of polyethylene web. Extrusion process releases a small amount of oil smoke, which is captured and treated through Smog-Hog brand scrubbers. The polyethylene web is rolled onto cores to form rolls to be carried to the extractors.

PEP#19: Extruder #1- Werner Fleg ZSK120- capacity 1800 lb/hr- installed 1969

PEP#20: Extruder #2- Werner Fleg ZSK120- capacity 1800 lb/hr- installed 1972
PEP#21: Extruder #3- Werner Fleg ZSK133- capacity 3000 lb/hr- installed March 1989
PEP#22: Extruder #4- Werner Fleg ZSK120- capacity 1800 lb/hr- installed March 1991
PEP#23: Extruder #5- Werner Fleg ZSK130- capacity 2000 lb/hr- installed March 1991
PEP#24: Extruder #6- Werner Fleg ZSK133- capacity 3000 lb/hr- installed April 1995

EP#06 FOUR EXTRACTORS

(Plant EP#25/Plant Emission Unit 4) as **Extractor #1**, installed 1969
 (Plant EP#32) as **Rewind Extractor #3**, installed 1990
 (Plant EP#26/ Plant Emission Unit 5) as **Extractor #2**, installed 1972.
 (Plant EP#43/Plant Emission Unit 6) as **Extractor #4**, installed December 1995.

Emission Control:

(Plant EP#29) **Carbon Bed for Extractors #1 & #2**, installed April 1972.
 (Plant EP#35) **Carbon Bed for Extractor #3**, installed March 1990.
 (Plant EP#38) **carbon Bed for Extractor #4**, installed December 1995.

Description:

Extractor #1: Combined with **Extractor #3**, maximum daily limit of 323 Gallons Solaf (87% n-Hexane), or n-Hexane emission 65 lb/hr.
Extractor #2: Maximum daily limit of 153 Gallons Solaf (87% n-Hexane), or 31 lb/hr n-Hexane Emission.
Extractor #4: Maximum daily limit of 120 Gallons Solaf (87% n-Hexane), or 25 lb/hr n-Hexane emission.

Polyethylene web from the extruders is fed into the extractors that use counter flow bath of Solaf solvent to remove the oil from the web. The emissions from the four extractors (evaporators, web paths, ovens, and other process equipment) are primarily n-Hexane which is collected into three carbon bed filters.

EP#10 (03) WEB PROCESS LINES

DESCRIPTION:

(Plant EP#45) as **E1 Evaporator**, emission control 95% by Carbon Bed #1.

 (Plant EP#27) as **E2 Web Path drying tunnel**, Hexane emission **0.7** lb/hr.
 (Plant EP#46) as **E2 Evaporator**, emission control 95% by Carbon Bed #1.

 (Plant EP#31) as **E3 Web Path drying oven**, emission **1.76** lb/hr.
 (Plant EP#33) as **E3 Seals/Piping**, emission **0.62** lb/hr.
 (Plant EP#34) as **E3 Process Tanks**, emission control 95% by Carbon Bed #2.

 (Plant EP#37) as **E4 Evaporator 3**, Hexane emission **0.5** lb/hr.
 (Plant EP#39) as **E4 Carbon Bed Piping**, Hexane emission **0.02** lb/hr.

(Plant EP#40) as E4 Process Tank Piping, Hexane emission **0.02** lb/hr.
(Plant EP#41) as E4 Seals/Piping, Hexane emission **1.18** lb/hr.
(Plant EP#44) as E4 Coater/dryer, Surfactant (Isopropanol).

(PEP#30) as Extractor #1, #3 Oven, Hexane emission **6.0** lb/hr, installed 1990.

(PEP#45) as Evaporator #1 Oven, emission combined with Carbon Bed #1.

(PEP#28) as Extractor #2 Oven, Hexane emission **6.85** lb/hr, installed 1972.

(PEP#36) as Extractor #4 Oven, Hexane emission **6.0** lb/hr, installed 1995.

(PEP#37) as Evaporator #3 Oven, Hexane emission 0.5 lb/hr, installed 1995.

(PEP# 42) as E4 Low Emission Level Oven, Hexane emission **0.9** lb/hr.